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A Method for Reasoning About an Acquisition Strategy

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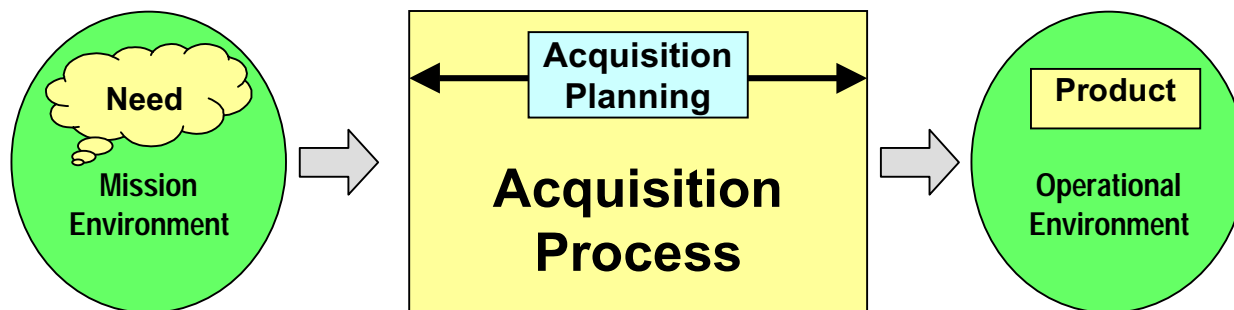
Acquisition Process

Transforms a “Need” into a “Product”

Complex process in a challenging environment

Success requires careful planning and diligent execution

- Planning starts with the development of an **ACQUISITION STRATEGY**





Research Focus

Key problems with acquisition strategy development

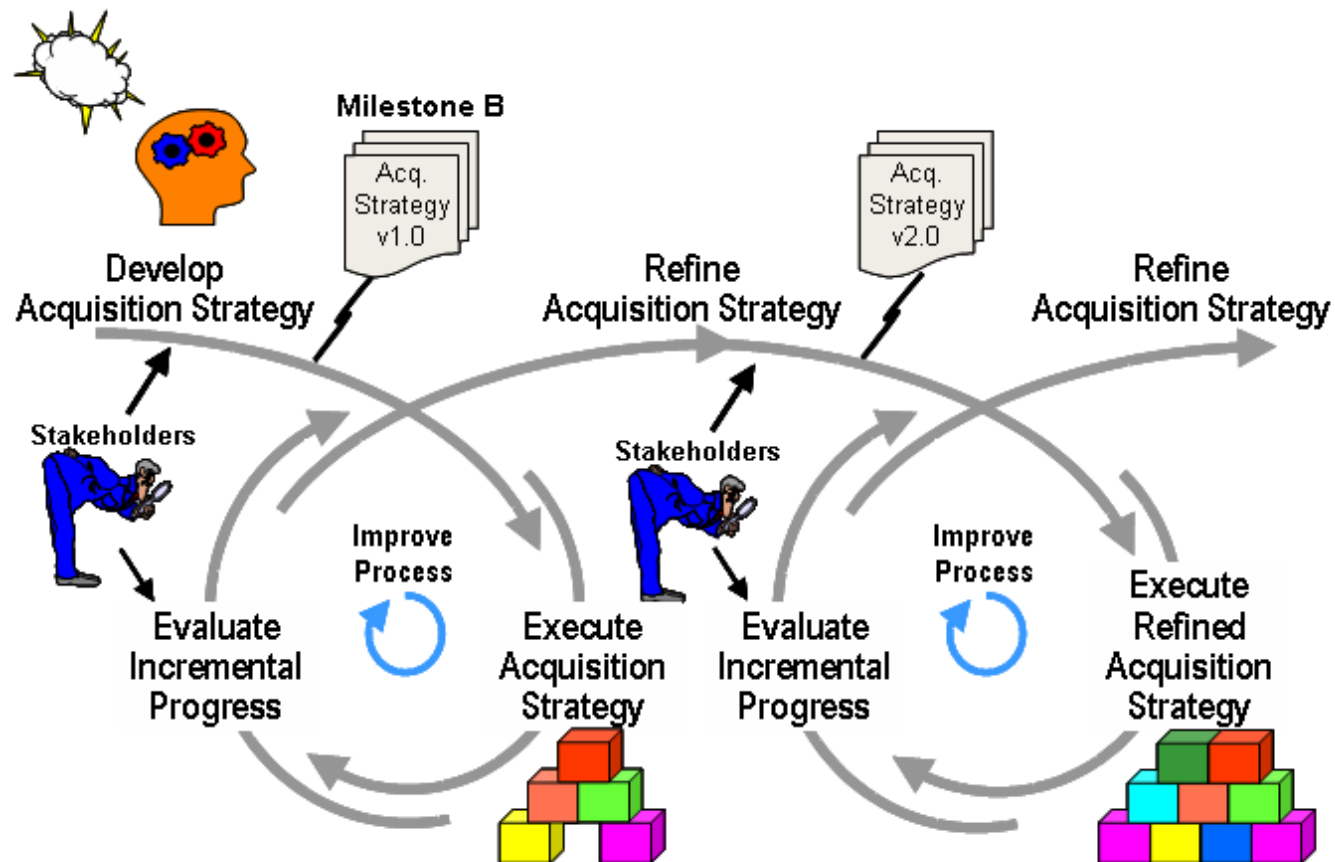
- Disassociated from its foundation: risk reduction
- Unique nature of software risks not always considered in larger acquisition strategy

Research focus

- Support a more systematic approach to reasoning about software risk on a program
 - Drivers
 - Strategy Elements



Acquisition Strategy





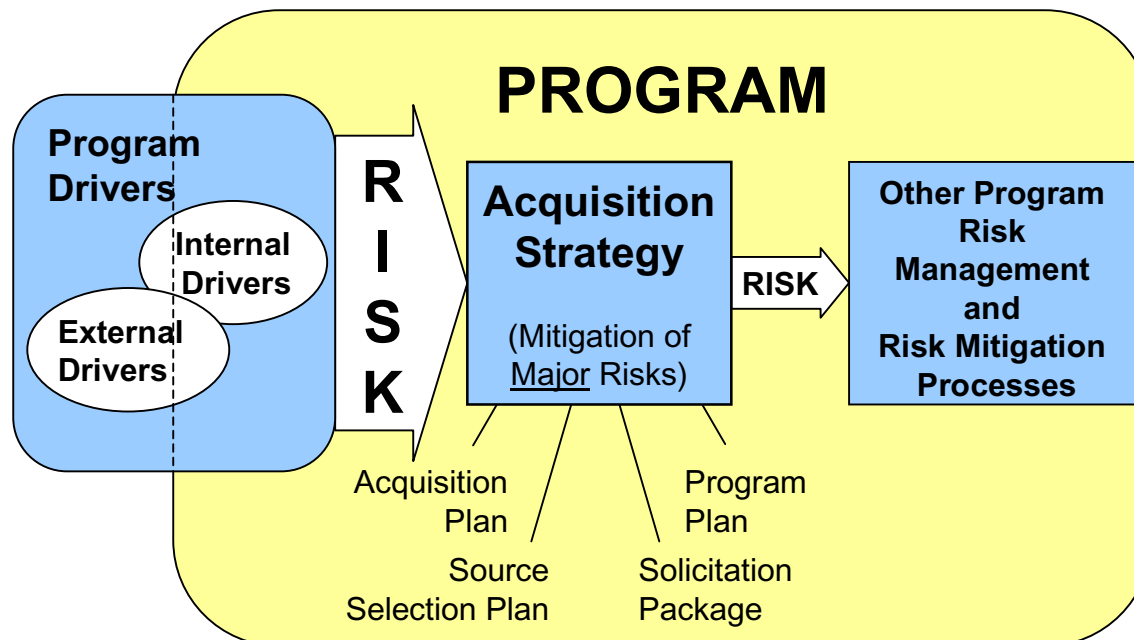
A Systems Engineering Approach to Acquisition Strategy Development

- Define the objectives of the acquisition strategy
- Decompose the strategy into individual strategy elements
- Identify and evaluate the factors that drive strategic choices for each strategy element
- Choose strategies for each element that best address the driving factors
- Integrate the strategy elements into a coherent acquisition strategy



Acquisition Strategy Objective

... Risk Mitigation !





Strategy Elements*

Program Structure

Acquisition Approach

Business Considerations

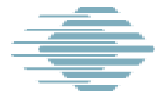
- Competition
- Solicitation Type
- Source Selection
- Contract Approach

Risk Management

Test and Evaluation

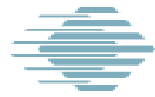
Product Support

* Partial list



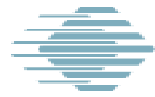
Strategy Elements 2

Strategy Element	Strategic Choices
Acquisition Approach	<ul style="list-style-type: none">• Single step• Evolutionary – incremental• Evolutionary - Spiral
Business Considerations: <i>Competition</i>	<ul style="list-style-type: none">• Full and Open• Full and Open After Exclusion of Sources• Sole Source Contracting
Business Considerations: <i>Solicitation</i>	<ul style="list-style-type: none">• Invitation for Bid (IFB)• Request for Proposal (RFP) with SOW• Request for Proposal (RFP) with SOO• Request for Quotation (RFQ)• Request for Information (RFI)



Strategy Elements ₃

Strategy Element	Strategic Choices
Business Considerations: <i>Contract Approach</i>	<ul style="list-style-type: none">• Fixed-Price (FP) Contracts<ul style="list-style-type: none">• Firm FP• FP with Economic Price Adjustment• FP / Prospective Price Redetermination• Fixed-Ceiling-Price with Retroactive Price Redetermination• Firm FP, Level-of-Effort Term• Cost Contracts<ul style="list-style-type: none">• Cost Contract• Cost-Sharing Contract• Cost-Plus-Fixed-Fee Contract• Incentive Contracts<ul style="list-style-type: none">• Fixed-Price Incentive Contract• Fixed-Price Contract With Award Fees• Cost-Plus-Incentive-Fee Contract• Cost-Plus-Award-Fee Contract



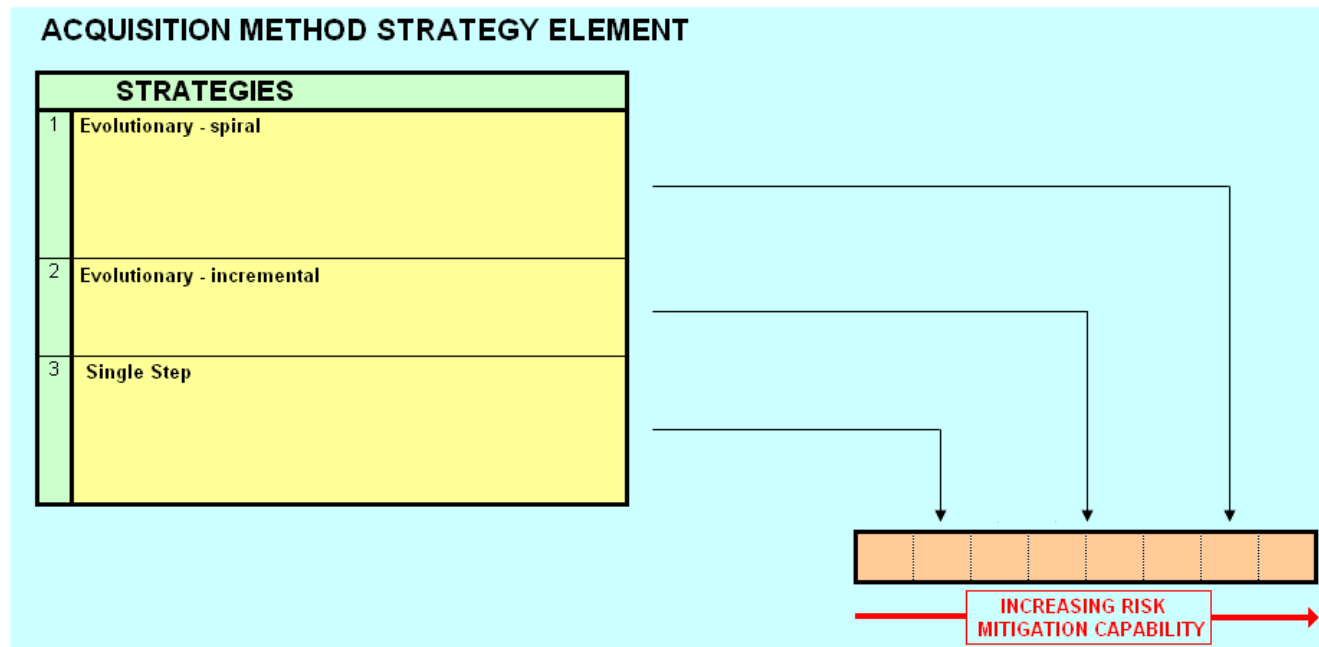
Strategy Elements 4

Strategy Element	Strategic Choices
Training	<ul style="list-style-type: none">• Self-Training• Computer-Based Training• Distance Learning• Classroom Training• Field Training
Product Support: <i>Source of Support</i>	<ul style="list-style-type: none">• Contractor Logistics Support• PMO Support• Depot Support• Organic Support



Ranking Strategic Choices

For each strategy element, rank the strategic choices per their ability to mitigate risk





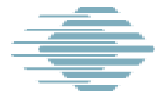
Acquisition Strategy Drivers

Software Criticality Category	Acquisition Environment Category	Programmatic Category	Organizational Category	Life Cycle Category
Software Criticality	Policies and Mandates	Mission Needs and Scope	PMO Capability	Product Definition & Specification
	Supplier Availability	Funding	Stakeholders	Architecture and Design
		Schedule	Supplier Capability	Verification and Test
				Deployment
				Maintenance and Support
				Disposal



Strategy Drivers ¹

Driver Category	Strategy Driver
Software Criticality	<ul style="list-style-type: none">• Magnitude of Software• Reliance on software
Acquisition Environment	<ul style="list-style-type: none">• Policies and Mandates<ul style="list-style-type: none">• <i>Conflict among mandates</i>• <i>Conflict with project objectives</i>• Supplier Availability
Programmatic	<ul style="list-style-type: none">• Mission Needs and Scope<ul style="list-style-type: none">• <i>Definition</i>• <i>Flexibility</i>• Funding<ul style="list-style-type: none">• <i>Funding Constraints</i>• <i>Funding Profile</i>• Schedule<ul style="list-style-type: none">• <i>Schedule Constraints</i>• <i>Urgency</i>



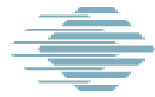
Strategy Drivers 2

Driver Category	Strategy Driver
Organizational	<ul style="list-style-type: none">• Program Management Office capabilities<ul style="list-style-type: none">• <i>PMO Staff Skills</i>• <i>PMO Staff Capacity</i>• <i>PMO Staff Stability</i>• <i>PMO Process Focus</i>• Stakeholders<ul style="list-style-type: none">• <i>Number and Diversity</i>• <i>Level of Engagement (responsiveness and quality)</i>• <i>Level of Agreement</i>• Supplier Capability<ul style="list-style-type: none">• <i>Supplier Staff Skills</i>• <i>Supplier Staff Capacity</i>• <i>Supplier Staff Stability</i>• <i>Supplier Performance to Date</i>



Strategy Drivers ³

Driver Category	Strategy Driver
Life-cycle: <i>Product Definition and Specification</i>	<ul style="list-style-type: none">• Requirements Volatility• Requirements Understanding• Quality Attribute Definitions• Interoperability
Life-cycle: <i>Architecture and Design</i>	<ul style="list-style-type: none">• Precedence• Quality Attribute Constraints• Technology Readiness• Legacy Considerations• COTS / GOTS / Reuse
Life-cycle: <i>Verification and Test</i>	<ul style="list-style-type: none">• Test Environment Complexity• Test Environment Availability• Number of System Configurations

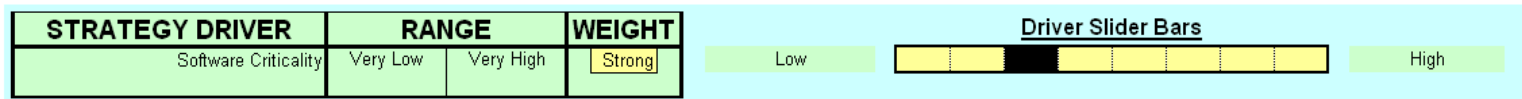
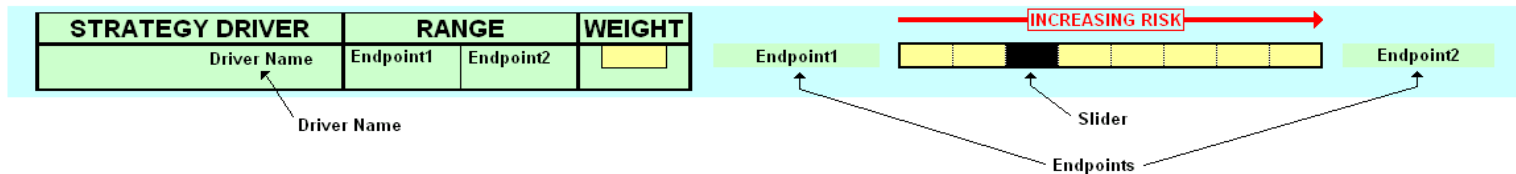
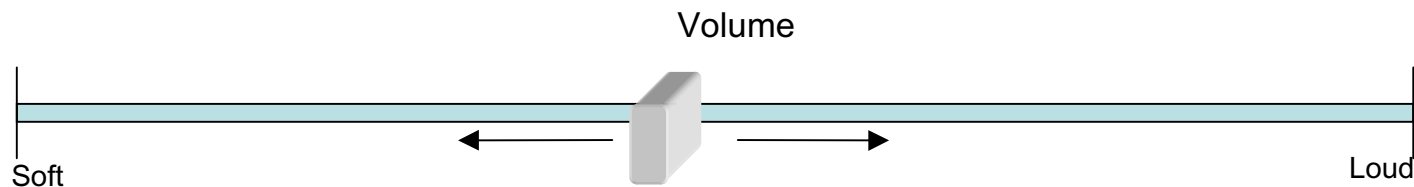


Strategy Drivers 4

Driver Category	Strategy Driver
Life-cycle: <i>Deployment</i>	<ul style="list-style-type: none">• Number of Sites• User Readiness• Maintainer Readiness• Transition / Data Migration
Life-cycle: <i>Maintenance and Support</i>	<ul style="list-style-type: none">• Number of System Configurations• Update Readiness• Support Duration• Re-competition Readiness• Operational Environment• Legacy Considerations• Availability of Data Rights
Life-cycle: <i>Disposal</i>	<ul style="list-style-type: none">• Security• Archiving



Driver Evaluation using Slider Bars





Evaluating Drivers

Version: 0.2
Date:
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STRATEGY DRIVER ASSESSMENT

DRIVER	RANGE	
Software Criticality	Very Low	Very High
Policies and Mandates	Low	High
Supplier Availability	High	Low
Funding Constraints	Few	Many
Funding Profile	Mismatched	Matched
Schedule Constraints	Few	Many
PMO Staff Skills	Strong	Weak
PMO Staff Capacity	Adequate	Inadequate
Requirements Volatility	Low	High
Quality Attribute Constraints	Low	High
Technology Readiness	Mature	Immature

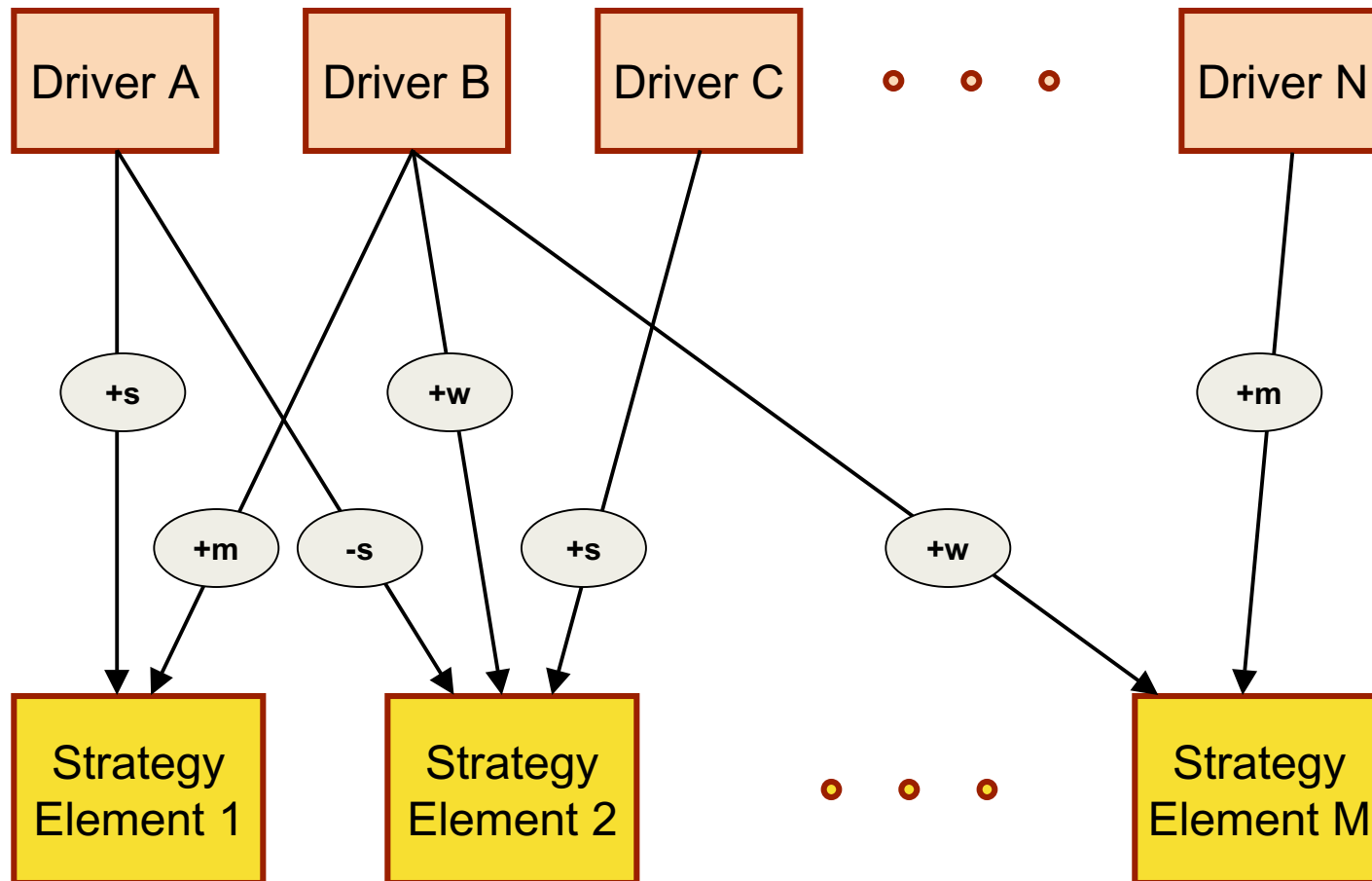
Place an "X" in the box representing your evaluation for each driver (one "X" per row)

Driver Slider Bars

INCREASING RISK →



Mapping Drivers to Strategies ₁



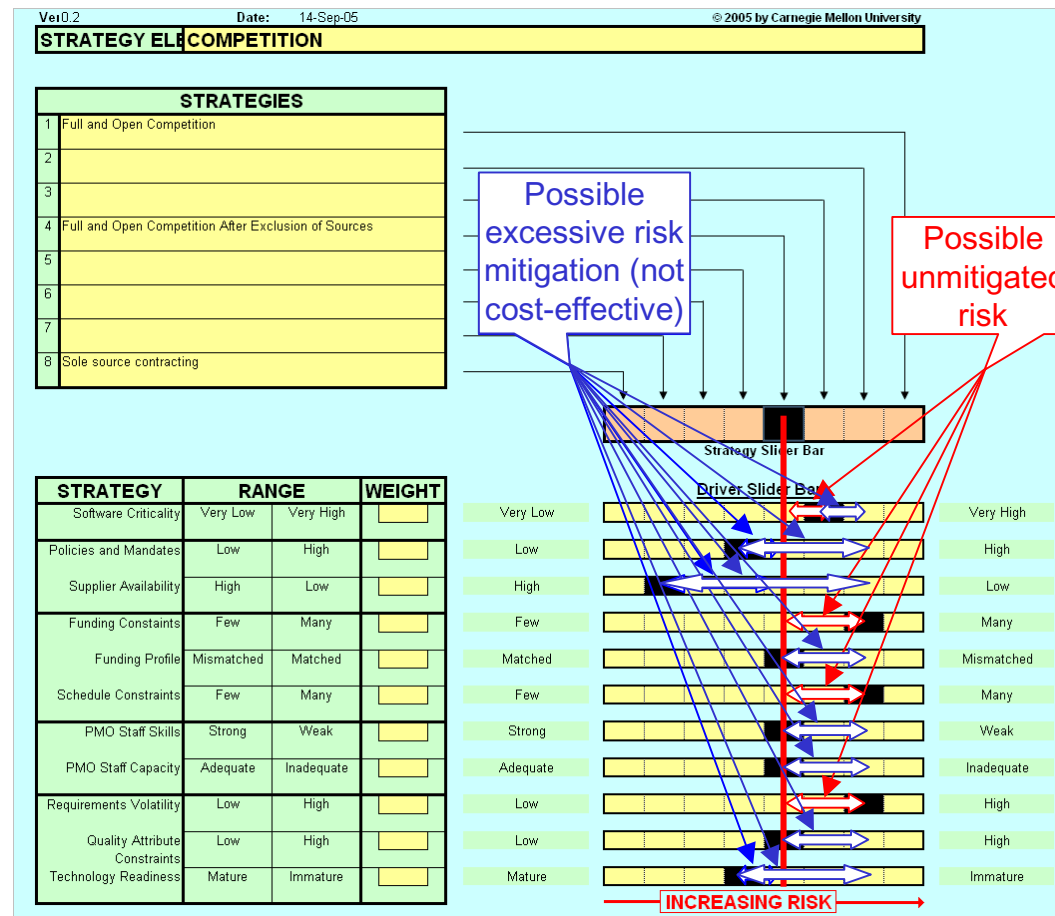


Mapping Drivers to Strategies 2

		STRATEGY ELEMENTS											
		Pgrm		Acquisition Approach	Business				Risk Management	Test and Evaluation	Product		
		Milestone Decision Points	Acquisition Phases		Competition	Solicitation Type	Source Selection	Contract Approach			Training	Installation	Source of support
KEY			Weak or No Linkage										
M			Medium Linkage										
S			Strong Linkage										
STRATEGY DRIVERS	Software Criticality	S	S	S	S	S	S	S		S	S	S	M
	Acquisition Environment												
	Policies and Mandates	S	S	S	S	S	S	S		S	S	S	S
	Supplier Availability		S	S	S	S	S	S			M	M	S
	Programmatic Category Drivers												
	Mission Needs and Scope	S	S	S	S	S	S	S	M	S	S	S	S
	Funding												
	Funding Constraints	S	S	S	S	S	S	S	M	S	S	S	S
	Funding Profile	S	S	S	S		M	S		M	M	M	S
	Schedule												
Schedule Constraints	S	S	S	S	S	S	S	M	S	S	S	S	
Urgency	S	S	S	S	S	S	S	M	S	S	S	S	



Evaluating Strategic Choices





Research Status

Original effort (funded by US Army) is complete

- Technique piloted with US Army GCCS program.
- Technical Report (*“Techniques for Developing an Acquisition Strategy by Profiling Software Risks”*) available on SEI web site (<http://www.sei.cmu.edu>) Dec 05
- Spreadsheet tool available on SEI web site Dec-05

Future efforts

- Refine the process via “use and learn”
- Expand technical report to include guidance for more strategy elements.



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Conclusion

Questions ?

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